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Al-Shamma'a, A.I.; Shaw, A.; Saman, S.;

Antennas and Propagation, IEEE Transactions on , Volume: 52 , Issue: 11 , November 2004

Pages:2843 - 2849

[\[Abstract\]](#) [\[PDF Full-Text \(1160 KB\)\]](#) IEEE JNL

2 A vehicle-borne urban 3-D acquisition system using single-row laser range scanners
Huijing Zhao; Shibasaki, R.;

Systems, Man and Cybernetics, Part B, IEEE Transactions on , Volume: 33 , Issue: 4 , Aug. 2003

Pages:658 - 666

[\[Abstract\]](#) [\[PDF Full-Text \(3266 KB\)\]](#) IEEE JNL

3 An algorithm for distinguishing the types of objects on the road using laser radar and vision
Shimomura, N.; Fujimoto, K.; Oki, T.; Muro, H.;

Intelligent Transportation Systems, IEEE Transactions on , Volume: 3 , Issue: 3 , Sept. 2002

Pages:189 - 195

[\[Abstract\]](#) [\[PDF Full-Text \(302 KB\)\]](#) IEEE JNL

4 An obstacle detection method by fusion of radar and motion stereo*Kato, T.; Ninomiya, Y.; Masaki, I.;*

Intelligent Transportation Systems, IEEE Transactions on , Volume: 3 , Issue: 3 , Sept. 2002

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5 The Torus Treadmill: realizing locomotion in VEs*Iwata, H.;*

Computer Graphics and Applications, IEEE , Volume: 19 , Issue: 6 , Nov.-Dec. 1999

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6 Vision-only aircraft flight control*De Wagter, C.; Proctor, A.A.; Johnson, E.N.;*

Digital Avionics Systems Conference, 2003. DASC '03. The 22nd , Volume: 2 , 16 Oct. 2003

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7 Road detection and vehicles tracking by vision for an on-board ACC system in the VELAC vehicle*Chapuis, R.; Marmoiton, F.; Aufrere, R.; Collange, F.; Derutin, J.;*

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8 Improvement of odometry for omnidirectional vehicle using optical information*Nagatani, K.; Tachibana, S.; Sofne, M.; Tanaka, Y.;*

Intelligent Robots and Systems, 2000. (IROS 2000). Proceedings. 2000 IEEE/ International Conference on , Volume: 1 , 31 Oct.-5 Nov. 2000

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Xu Youchun; Wang Rongben; Libing; Ji Shouwen;

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12 Vision for longitudinal vehicle control

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13 Autonomous robot navigation for precision horticulture

Hague, T.; Marchant, J.A.; Tillett, N.D.;

Robotics and Automation, 1997. Proceedings., 1997 IEEE International Conference on , Volume: 3 , 20-25 April 1997

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14 Vision based autonomous underwater vehicle navigation: underwater cable tracking

Balasuriya, B.A.A.P.; Takai, M.; Lam, W.C.; Ura, T.; Kuroda, Y.;

OCEANS '97. MTS/IEEE Conference Proceedings , Volume: 2 , 6-9 Oct. 1997

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15 The implementation of a vehicle identification function for a longitudinal ranging system

Hattori, M.;

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An obstacle detection method by fusion of radar and motion stereo

 Kato, T. [Ninomiya, Y.](#) [Masaki, I.](#)

Toyota Central R&D Labs. Inc., Aichi, Japan

 This paper appears in: **Intelligent Transportation Systems, IEEE Transac**

Publication Date: Sept. 2002

On page(s): 182 - 188

Volume: 3 , Issue: 3

ISSN: 1524-9050

Inspec Accession Number: 7406583

Abstract:

In order to avoid collision with an object that blocks the course of a **vehicle**, the **distance** to it and detecting **positions** of its side boundaries, are necessary. In this paper, an object detection method achieved by the fusion of millimeter-wave single video camera is proposed. We consider the method as the least expensive because at least one camera is necessary for lane marking detection. In the next distance is measured by the radar, and the boundaries are found from an image sequence, based on a motion stereo technique with the help of the distance measured by the radar. Since the method does not depend on the appearance of objects, it is effective for detecting not only an automobile but also other objects. Object detection by this method was confirmed through an experiment. In the experiment, both a stationary and a moving object were detected and a pedestrian as well as a vehicle was detected.

Index Terms:

collision avoidance **distance** measurement object detection radar applications road sensor fusion stereo **image** processing collision avoidance **distance** measurement sequence lane marking detection millimeter-wave radar motion stereo technique object object detection obstacle detection method pedestrian sensor fusion stationary object **vehicle** video camera

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10, M. Beauvais and S. Lakshmanan, "CLARK: A heterogeneous sensor fusion architecture for finding lanes and obstacles," in *Proc. IEEE Int. Conf. Intelligent Vehicles*, 1997, pp. 475-480.

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Intelligent Vehicles Symposium, 1996., Proceedings of the 1996 IEEE , 19-20 1996

Pages:53 - 57

[\[Abstract\]](#) [\[PDF Full-Text \(320 KB\)\]](#) IEEE CNF17 **Experience with Visual Robot Navigation***Matthies, L.; Thorpe, C.;*

OCEANS , Volume: 16 , Sep 1984

Pages:594 - 597

[\[Abstract\]](#) [\[PDF Full-Text \(400 KB\)\]](#) IEEE CNF18 **Extraction and tracking of the license plate using Hough transform voted block matching***Yanamura, Y.; Goto, M.; Nishiyama, D.; Soga, M.; Nakatani, H.; Saji, H.;*

Intelligent Vehicles Symposium, 2003. Proceedings. IEEE , 9-11 June 2003

Pages:243 - 246

[\[Abstract\]](#) [\[PDF Full-Text \(381 KB\)\]](#) IEEE CNF19 **Distance/motion-based segmentation under heavy background noi***Yajun Fang; Masaki, I.; Horn, B.;*

Intelligent Vehicle Symposium, 2002. IEEE , Volume: 2 , 17-21 June 2002

Pages:483 - 488 vol.2

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20 A study on recognition of lane and movement of vehicles for port A vision system

Jin Woo Lee; Jung Ho Kim; Young Jin Lee; Kwon Soon Lee;

Industrial Electronics, 2002. ISIE 2002. Proceedings of the 2002 IEEE International Symposium on , Volume: 2 , 8-11 July 2002

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21 Stochastic road shape estimation

Southall, B.; Taylor, C.J.;

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22 A study on recognition of road lane and movement of vehicles using vision system

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23 Visual sensing in electronic truck coupling

Lorei, M.; Stiller, C.;

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24 Longitudinal and lateral control of heavy duty trucks for automated vehicle following in mixed traffic: experimental results from the CHAUFFEUR project

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Control Applications, 1999. Proceedings of the 1999 IEEE International Conference on , Volume: 2 , 22-27 Aug. 1999

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25 A monocular vision-based position sensor using neural networks for automated vehicle following

Omura, Y.; Funabiki, S.; Tanaka, T.;

Power Electronics and Drive Systems, 1999. PEDS '99. Proceedings of the IEEE 1999 International Conference on , Volume: 1 , 27-29 July 1999
Pages:388 - 393 vol.1

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26 Fusion of fixation and odometry for vehicle navigation

Adam, A.; Rivlin, E.; Rotstein, H.;

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Pages:1638 - 1643 vol.2

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27 Map based underwater navigation using a multibeam echosounder

Sistiaga, M.; Opderbecke, J.; Aldon, M.J.; Rigaud, V.;

OCEANS '98 Conference Proceedings , Volume: 2 , 28 Sept.-1 Oct. 1998
Pages:747 - 751 vol.2

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28 A trajectory-based approach for the lateral control of car following systems

Gehrig, S.K.; Stein, F.J.;

Systems, Man, and Cybernetics, 1998. 1998 IEEE International Conference on , Volume: 4 , 11-14 Oct. 1998
Pages:3596 - 3601 vol.4

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29 Hard real-time scheduling of distance-constrained sensor tasks with monitoring system for mobile robot guidance

Laloni, C.; Gutsche, R.; Wahl, F.M.;

Systems, Man and Cybernetics, 1995. 'Intelligent Systems for the 21st Century' IEEE International Conference on , Volume: 1 , 22-25 Oct. 1995
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30 Real-time vision-based tracking of submarine-cables for AUV/ROV

Matsumoto, S.; Ito, Y.;

OCEANS '95. MTS/IEEE. 'Challenges of Our Changing Global Environment'. Conference Proceedings. , Volume: 3 , 9-12 Oct. 1995
Pages:1997 - 2002 vol.3

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Collision avoidance using artificial retina sensor in

Kim, K.I. Shin, C.W. Inoguchi, S.

Pohang Inst. of Sci. & Technol., South Korea;

This paper appears in: Intelligent Vehicles '95 Symposium., Proceedings

Meeting Date: 09/25/1995 - 09/26/1995

Publication Date: 25-26 Sept. 1995

Location: Detroit, MI USA

On page(s): 183 - 187

Reference Cited: 13

Inspec Accession Number: 5107096

Abstract:

The artificial retina sensor (ARS) which was developed at Osaka University in applied to PRV II (POSTECH Road Vehicle II) for real time collision avoidance speed navigation. ARS consists of a linear CCD sensor and a dove prism rotat of the camera lens. Since ARS provides polar domain images directly from the and projection invariance in a polar coordinate system can be utilized directly only has to apply an edge detection and a template matching method to the l direction. Then optical-flow of moving objects is estimated to obtain 3D distar time-to-impact informations from obstacles. To verify the validity of the the a proposed technique, real images are taken using an ARS mounted on PRV II : analyzed

Index Terms:

3D distance ALV CCD image sensors Osaka University POSTECH Road Vehic
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 flow polar coordinate system polar domain images position control projection in
 real time collision avoidance road vehicles size invariance template matching tin

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Kim, K.I. Shin, C.W. Inoguchi, S.

Pohang Inst. of Sci. & Technol., South Korea;

This paper appears in: Intelligent Vehicles '95 Symposium., Proceedings

Meeting Date: 09/25/1995 - 09/26/1995

Publication Date: 25-26 Sept. 1995

Location: Detroit, MI USA

On page(s): 183 - 187

Reference Cited: 13

Inspec Accession Number: 5107096

Abstract:

The artificial retina sensor (ARS) which was developed at Osaka University in applied to PRV II (POSTECH Road Vehicle II) for real time collision avoidance speed navigation. ARS consists of a linear CCD sensor and a dove prism rotator of the camera lens. Since ARS provides polar domain images directly from the and projection invariance in a polar coordinate system can be utilized directly only has to apply an edge detection and a template matching method to the horizontal direction. Then optical-flow of moving objects is estimated to obtain 3D distance-to-impact informations from obstacles. To verify the validity of the proposed technique, real images are taken using an ARS mounted on PRV II and analyzed.

Index Terms:

[3D distance](#) [ALV](#) [CCD image sensors](#) [Osaka University](#) [POSTECH Road Vehicle II](#) [artificial retina sensor](#) [collision avoidance](#) [dove prism rotating](#) [edge detection](#) [navigation](#) [horizontal direction](#) [image sequences](#) [linear CCD sensor](#) [object detection](#) [flow](#) [polar coordinate system](#) [polar domain images](#) [position control](#) [projection invariance](#) [real time collision avoidance](#) [road vehicles](#) [size invariance](#) [template matching](#) [time](#)

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An integrated stereo-based approach to automatic guidance

[Luong, Q.-T.](#) [Weber, J.](#) [Koller, D.](#) [Malik, J.](#)

Dept. of Comput. Sci., California Univ., Berkeley, CA, USA;

This paper appears in: Computer Vision, 1995. Proceedings., Fifth International Conference on

Meeting Date: 06/20/1995 - 06/23/1995

Publication Date: 20-23 June 1995

Location: Cambridge, MA USA

On page(s): 52 - 57

Reference Cited: 18

Inspec Accession Number: 5032540

Abstract:

Proposes a new approach for vision-based longitudinal and lateral **vehicle** control. A novel feature of this approach is the use of binocular vision. We integrate two modules consisting of a new, domain-specific, efficient binocular stereo algorithm, and a marker detection algorithm, and show that the integration results in an improved performance for each of the modules. Longitudinal control is supported by determining the **distances** to leading **vehicles** using binocular stereo. The known camera geometry with respect to the locally planar road is used to map the features of the road plane in the two camera views into alignment. This allows us to segment **image** features into those lying in the road plane, e.g. lane markers, and those of other objects which are dynamically integrated into an obstacle map. Therefore, in contrast with the previous work, we can cope with the difficulties arising from the occlusion of lane markers by other **vehicles**. The detection and measurement of the lane provides us with the **positional** parameters and the road curvature which are used for lateral vehicle control. Moreover, this information is also used to update the camera geometry with respect to the road, therefore allowing us to cope with the perspective distortions and road inclination to obtain consistent results from binocular stereo.

Index Terms:

[alignment](#) [automatic vehicle guidance](#) [binocular stereo](#) [binocular vision](#) [camera geometry](#) [camera views](#) [computer vision](#) [distance detection](#) [distance measurement](#) [domain-specific](#) [efficient binocular stereo algorithm](#) [image feature mapping](#) [integrated stereo-based approach](#) [lane marker detection algorithm](#) [leading vehicles](#) [locally planar road](#) [modules](#) [obstacle map](#) [occlusion](#) [performance](#) [positional parameters](#) [road vehicles](#) [stereo image processing](#) [tracking](#) [traffic control](#) [traffic engineering computing](#) [vibrations](#) [vision based lateral control](#) [vision based longitudinal vehicle control](#) [alignment](#) [automatic vehicle guidance](#) [binocular stereo](#) [binocular vision](#) [camera geometry](#) [camera views](#) [computer vision](#) [distance detection](#) [distance measurement](#) [domain-specific efficient binocular stereo algorithm](#) [feature mapping](#) [integrated stereo-based approach](#) [lane marker detection algorithm](#) [vehicles](#) [locally planar road](#) [modules](#) [obstacle map](#) [occlusion](#) [performance](#) [positional parameters](#) [road vehicles](#) [stereo image processing](#) [tracking](#) [traffic control](#) [traffic engineering computing](#) [vibrations](#) [vision based lateral vehicle control](#) [vision based longitudinal vehicle control](#)

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